

# Aging & Rehabilitation

## An Interdisciplinary Research Seminar Series



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- Center for Gerontological Studies

## UF McKnight Brain Institute

## UF College of Nursing

# Schedule

- January 9<sup>th</sup>, 2006 – May 22<sup>nd</sup>, 2006
- Mondays, 12:00 – 1:00
- Location: UF HPNP Building, Room G101
- Cyber Seminar:
  - VA RORC Conference Room, Commerce Building Downtown
  - VA BRRC Nursing Home Care Unit Conference Room (first floor)
  - UF Brooks Center Conference Room, Jacksonville (904) 306-8977

# Themes

- Basic Science
- Clinical Science
- Outcomes / Health Policy
- Behavioral and Social Research
- Cutting Edge / New Research

# Rehabilitation of Anomia in Aphasia

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**VA RR&D Brain Rehabilitation and Research Center**



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- **Karen Klenberg**

# Overview

- **Purpose of study**
- **Basic Definitions**
- **Design/Methods**
- **Results**
- **Discussion**

# Purpose

- **Phase 2 clinical treatment study**
  - Refine existing hypothesis
  - Develop an explanation for why the treatment may be efficacious
  - Specify target population
  - Standardize treatment protocol
  - Validity and reliability of outcome measures used to detect treatment activity
  - Optimize treatment dosage



## **DEFINITION: Anomic Aphasia**

- **Difficulty in word retrieval, with adequate auditory comprehension and repetition of the same words**
- **Difficulty naming seen objects, nouns, verbs or conveying meaning in spontaneous language**

# Purpose of study

- **Compare two types of treatment for anomia in fluent aphasia**
  - Phonologic (sounds)
  - Semantic (words)
- **Based on a parallel distributed model of phonology in aphasia (Nadeau, 2001)**
- **Primary Outcome**
  - Naming
- **Secondary Outcome**
  - Generalization to discourse

## **DEFINITION: Phonology**

- **Phoneme: smallest definable unit of language**
- **Phonology: “Subfield of linguistics concerned with the structure and systematic patterning of sounds in language”**

Akmajian, Demers & Harnish, 1984

**“bat” = /b/ + /a/ + /t/ =**

**3 sounds (phonemes), 3 letters (graphemes)**

**“shop” = /sh/ + /o/ + /p/ =**

**3 sounds (phonemes), 4 letters (graphemes)**

# DEFINITION: Semantics

- **“Store of knowledge regarding concepts”**  
(Caplan, 1993)

Somatosensory

Predicative

Acoustic

Linguistic

DOG

Visual

Olfactory

Limbic

# METHODS/DESIGN

- Twenty individuals randomized to receive either phonologic or semantic treatment
- Single subject, multiple baseline design with pre- and post-testing
- Primary Outcome
  - Naming
- Secondary Outcome
  - Generalization to discourse

	Phonologic Treatment	Semantic Treatment
Subjects	N = 10	N = 10

# **SUBJECTS**

- **Subjects recruited through the VA RR&D Brain Rehabilitation Center, Gainesville, Florida**
- **Extensive screening process**
- **Right handed, unilateral left hemisphere CVA, no depression, no progressive neurologic disease**
- **Additional language testing**
- **Anomic aphasia without significant apraxia of speech**

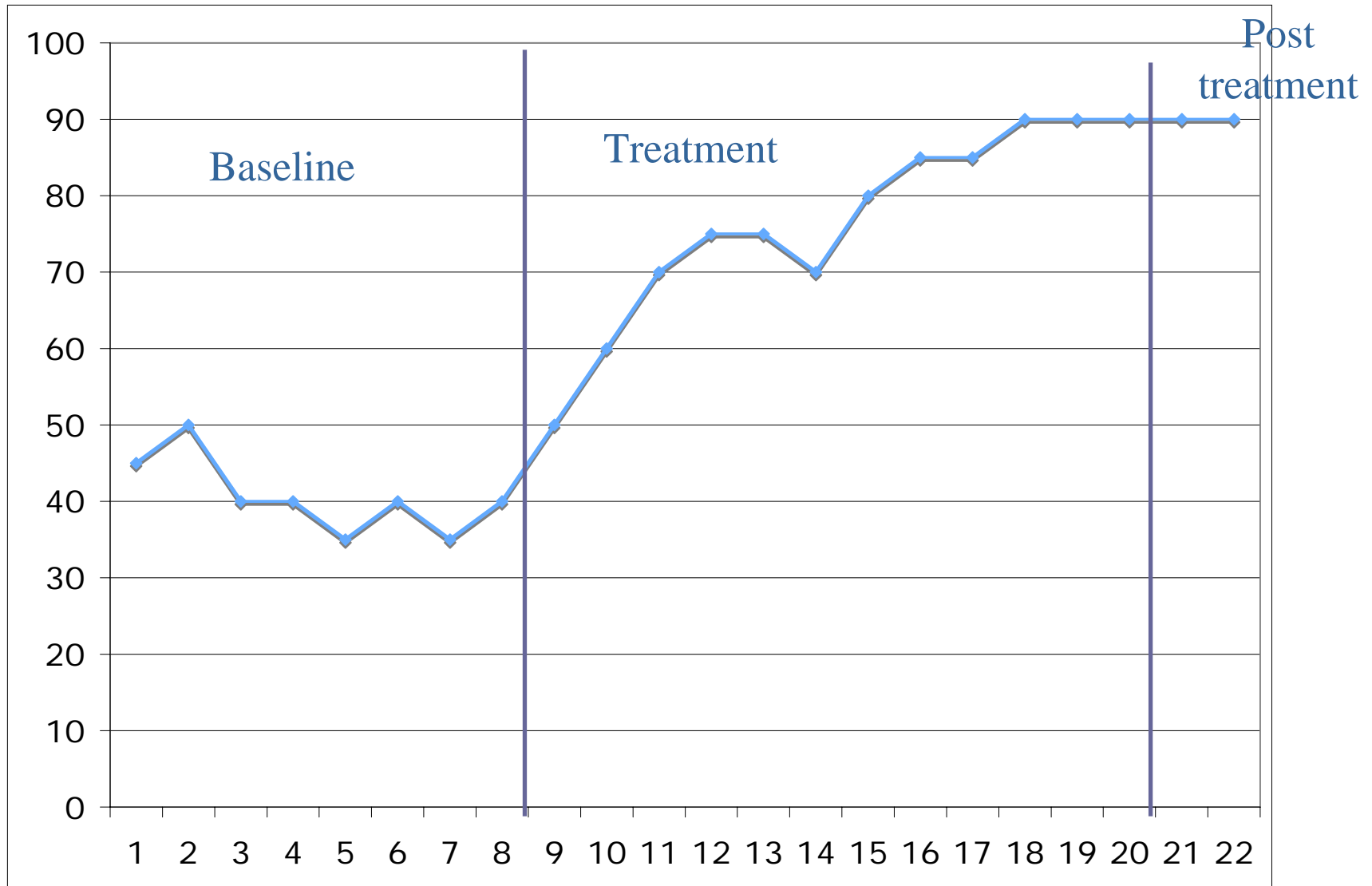
	Gender	Age	MPO
Phono 1	F	41	26
Phono 2	F	40	18
Phono 3	M	50	46
Phono 4	M	49	53
Phono 5	M	61	105
Phono 6	F	65	16
Phono 7	M	48	72
Phono 8	M	76	120
Phono 9	F	46	60
Phono 10	M	48	81
Semantic 1	M	76	120
Semantic 2	M	51	18
Semantic 3	M	67	127
Semantic 4	M	72	118
Semantic 5	M	67	26
Semantic 6	M	48	32
Semantic 7	F	57	30
Semantic 8	F	67	14
Semantic 9	F	82	156
Semantic 10	F	71	36

AVE	Gender	Age	MPO
Phono	6 M 4 F	52	60
Sem	6 M 4 F	66	68




<b><u>Baseline</u></b> <b>8 testing sessions within one week</b>	<b><u>Treatment</u></b> <b>2 hours/day</b> <b>4 days/week</b> <b>96 total hours</b> <b>12 weeks</b> <b>12 probes (1/week)</b>	<b>1-week Post Testing</b>	<b>3-month Post Testing</b>	<b>1-year Post Testing</b>
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# Example of single subject data




# Repeated Probes

	Treatment	Generalization	Generalization
Phono	Phoneme production 	Object/Action Naming Test	Discourse Production
Semantic	Picture naming (set of pictures used in treatment)	Object/Action Naming Test	Discourse Production

Primary  
outcome  
measure

# Repeated Probes

	Treatment	Generalization	Generalization
Phono	Phoneme production 	Object/Action Naming Test	Discourse Production
Semantic	Picture naming (set of pictures used in treatment)	Object/Action Naming Test	Discourse Production

Secondary  
outcome  
measure

# Pre- and Post-Testing

1. Western Aphasia Battery
2. Boston Naming Test
3. Controlled Word Association Test
4. Pyramids and Palm Trees
5. Comprehensive Test of Phonological Processes
6. Lindamood Auditory Conceptualization Test
7. Modified ASHA FAC's

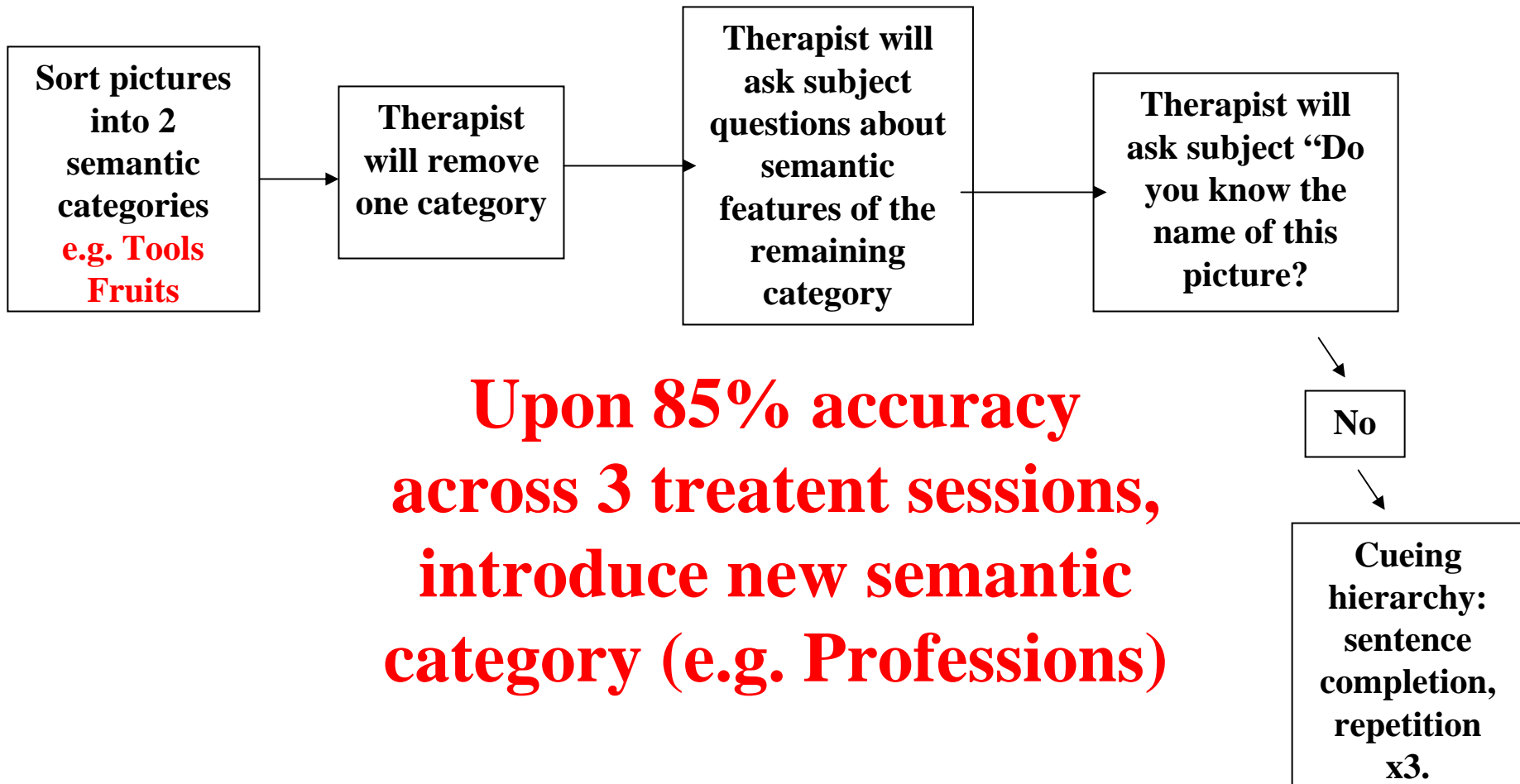
# Treatment Description

- **Semantic treatment**
- **Phonologic treatment**

# SEMANTIC TREATMENT

- **Stimuli**
  - **240 nouns**
  - **Controlled for word frequency**
  - **12 semantic groups (20 words per group)**
  - **Professions, tools, animals, games, school, body parts, transportation, household items, ocean, musical instruments, farm, fruit**

# SEMANTIC TREATMENT



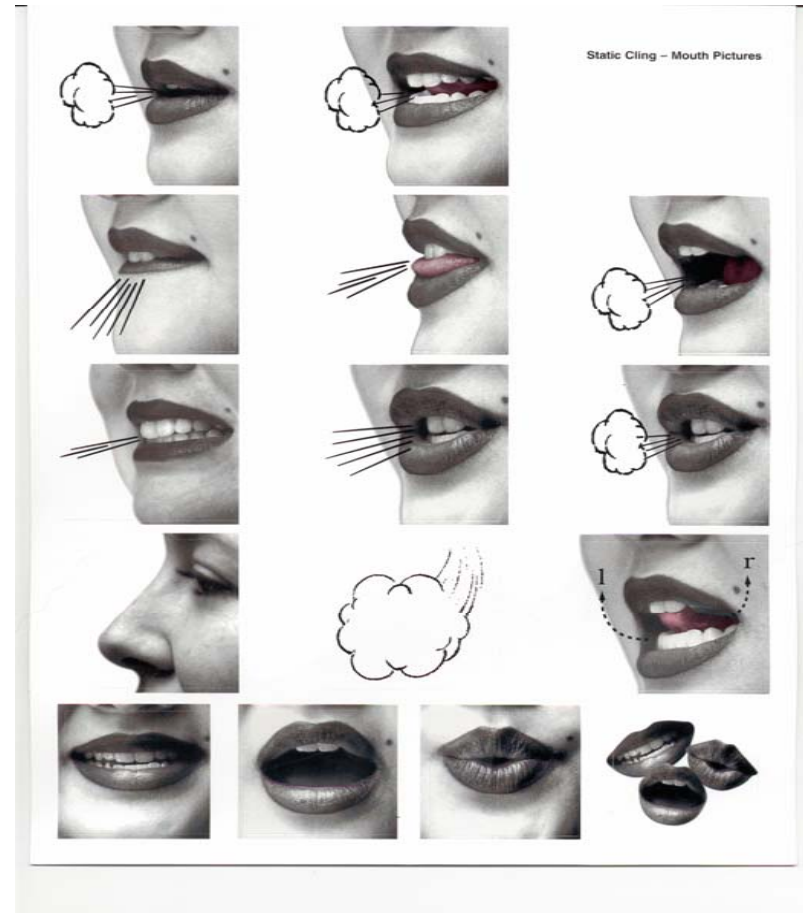


# PHONOLOGIC TREATMENT

- **Stage 1:**

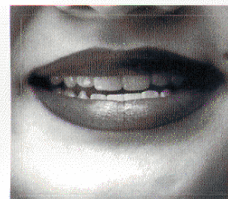
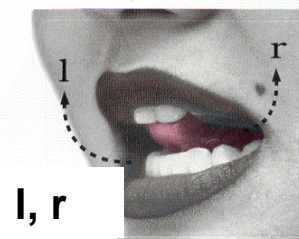
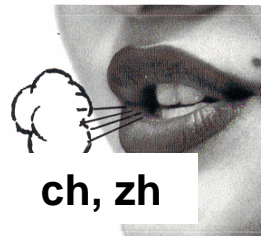
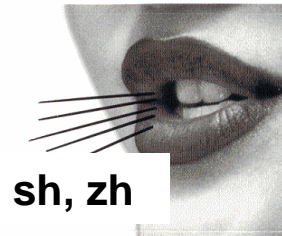
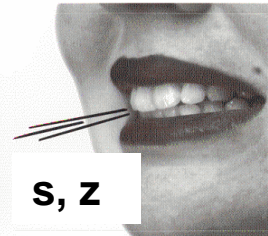
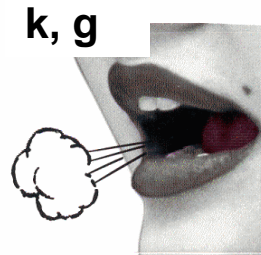
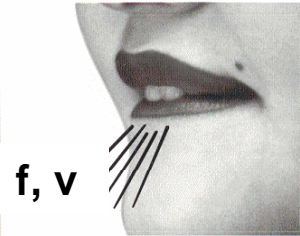
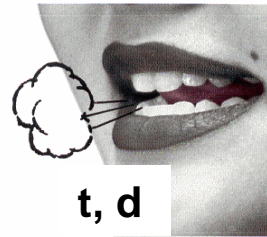
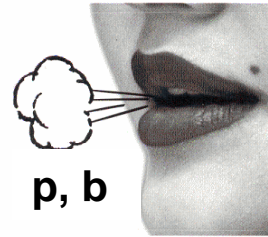
- **Oral Awareness Training**

- **How articulators move to produce phonemes**
    - **Use line drawings of mouth and articulators**
    - **Multisensory**
      - visual, auditory, oral tactile-kinesthetic



- **Stage 2**
  - Simple ***nonword*** training
    - train phonological awareness of V, CV, VC, CVC
    - determine the number, order, sameness/differences of phonemes
    - Example in video
    - progression from pictures of sounds, to blocks, to letters

Static Cling – Mouth Pictures



**vowels**

**Therapist: moth - zoth**

**Patient: moth - mos**

**Therapist: see if we match**

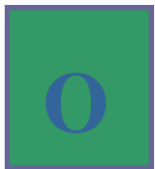
**Patient: moth - zoth**

**Therapist: touch each one**

**/m/ /o/ /th/**

**/z/ /o/ /th/**

**Which sound changes?**



# Results

# 1-week post treatment

	Treatment	Generalization	Generalization
Phono	<b>Phoneme production</b> 10/10	<b>Object/Action Naming Test</b> 8/10	<b>Discourse</b> Raw # words: 5/8 Raw # CIU: 4/8
Semantic	<b>Picture naming</b> 9/10	<b>Object/Action Naming Test</b> 2/10	<b>Discourse</b> Raw # words: 5/9 Raw # CIU: 6/9

# Conclusions – At one week

Treatment Effect	Both groups showed positive gains
Confrontation Naming	Phono group better than semantic
Discourse	Majority of both groups generalized



# Conclusions

- Both treatments were very effective for learning trained items
  - This finding in line with prior research.
- Phonologic group generalized to naming more than the semantic group.
- Both groups improved at the discourse level, however.....

# Conclusions

- .....only phonologic group maintained discourse at 3-months.
  - Phonologic therapy supposedly trains foundational building blocks of language.
  - Consistent to see maintenance 3 months and 1 year later.
- Questionable outcome measures
  - Sensitivity and specificity?

# Current Research

- VA RR&D Advanced Career Development Award (2005-2008) (Kendall, Velozo and Rosenbek)
- Standardized Assessment of Phonologic Function in Adult Aphasia
- Research Objectives:
  - Develop phonologic items
  - Collect data with 50 individuals with aphasia
  - Rasch analysis